

Faraday's Researches

708. When a few drops only of nitric acid were added to the vessel A, fig. 44, then the results were altogether different. In less than five minutes bubbles of gas appeared on the plates P' and P'' in the second vessel. To prove that this was the effect of the electric current (which by trial at *e*. was found at the same time to be passing), the connection at *e* was broken, and plates P' P'' cleared from bubbles and left in the acid of the vessel B, for fifteen minutes: during that time no bubbles appeared upon them; but on restoring the communication at *e*, a minute did not elapse before gas appeared in bubbles upon the plates. The proof, therefore, is most full and complete, that the current excited by dilute sulphuric acid with a little nitric acid in vessel A, has intensity enough to overcome the chemical affinity exerted between the oxygen and hydrogen of the water in the vessel B, whilst that excited by dilute sulphuric acid alone has *not* sufficient intensity.

709. On using a strong solution of caustic potassa in the vessel A, to excite the current, it was found by the decomposing effects at *e*, that the current passed. But it had not intensity enough to decompose the water in the vessel B; for though left for fourteen days, during the whole of which time the current was found to be passing, still not the slightest appearance of gas appeared on the plates P' P'', nor any other signs of the water having suffered decomposition.

710. Sulphate of soda in solution was then experimented with, for the purpose of ascertaining with respect to it, whether

a certain electrolytic intensity was also required for its decomposition in this state, in analogy with the result established with regard to water (709). The apparatus was arranged as in fig. 45; P and Z are the platina and zinc plates dipping into a

solution of
common salt;
a and *b* are
platina plates
connected by
wires of platina
(except in the
galvano-
meter *g*) with *P*
and *Z*; *c* is a
connecting
wire of platina,
the ends of
which can be

Fig. 45-

made to rest either on the plates *a*,
b, or on the papers moistened
in solutions which are placed upon
them; so that the passage
of the current without
decomposition, or with one or two decom-
positions, was under ready
command, as far as arrangement
was concerned. In order to change
the *anodes* and *cathodes* at
the places of decomposition, the
form of apparatus, fig. 46, was